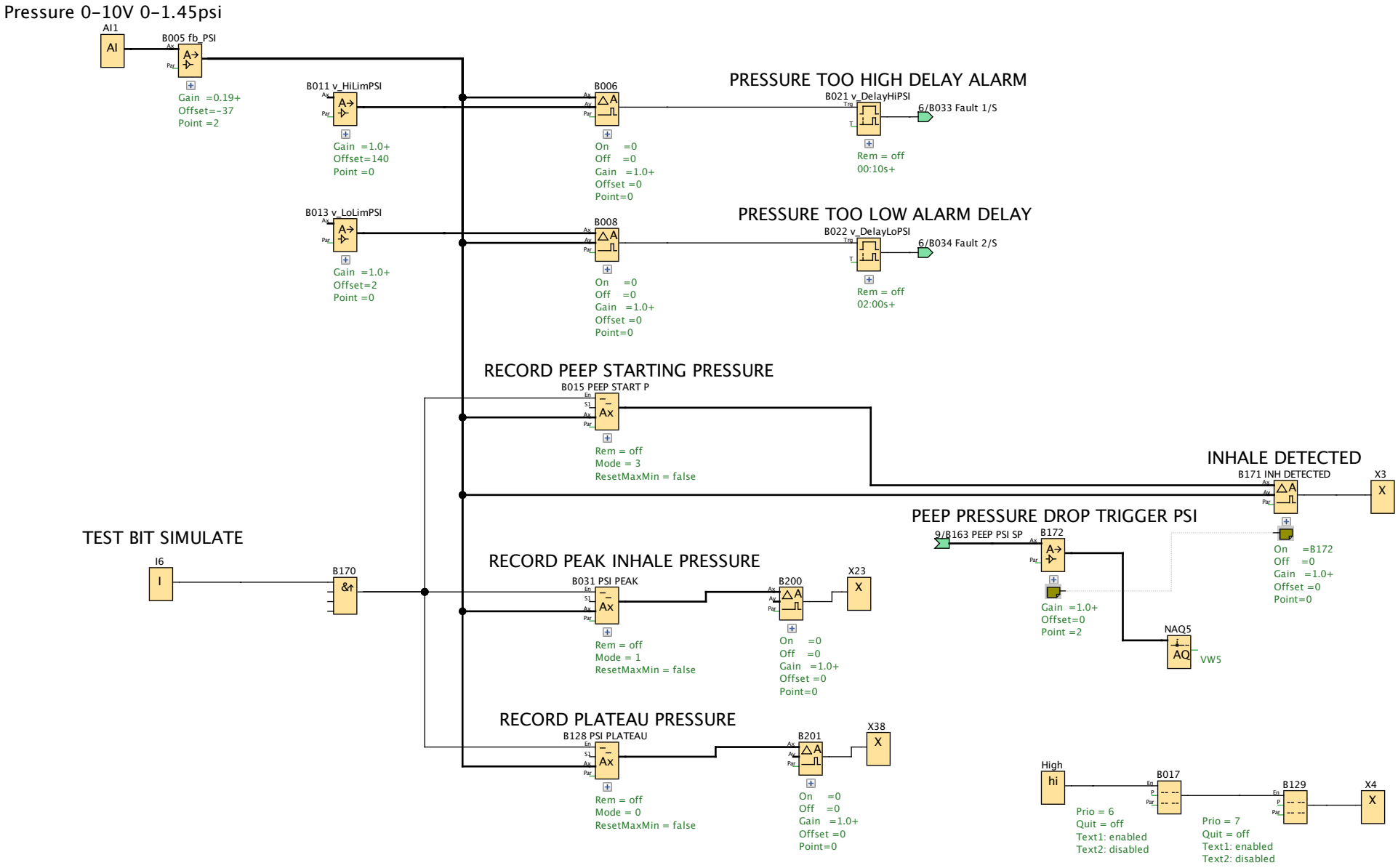
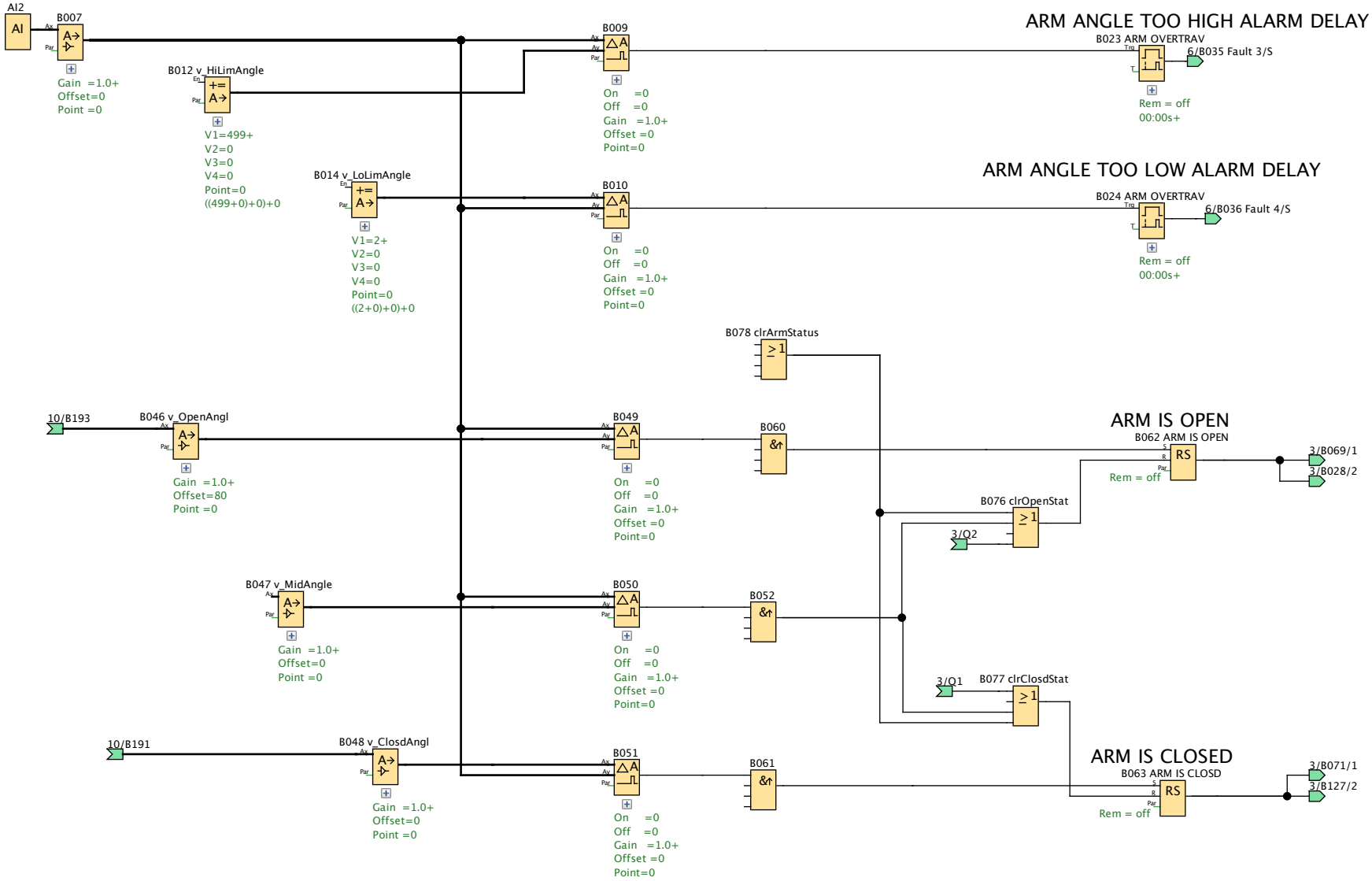
PAGE 1 - PRESSURE MEASUREMENT



Creator:	Eric Tischer		Project:	DIY Ventilator	Customer:	OpenSource
Checked:			Installation:		Diagram No.:	
Date:	3/28/20 2:00 PM/4/2/20 6:44 PM		File:		Page:	1 / 31

PAGE 2 - ARM ANGLE MEASUREMENT

ARM ANGLE 0-5V = 0-180 DEG



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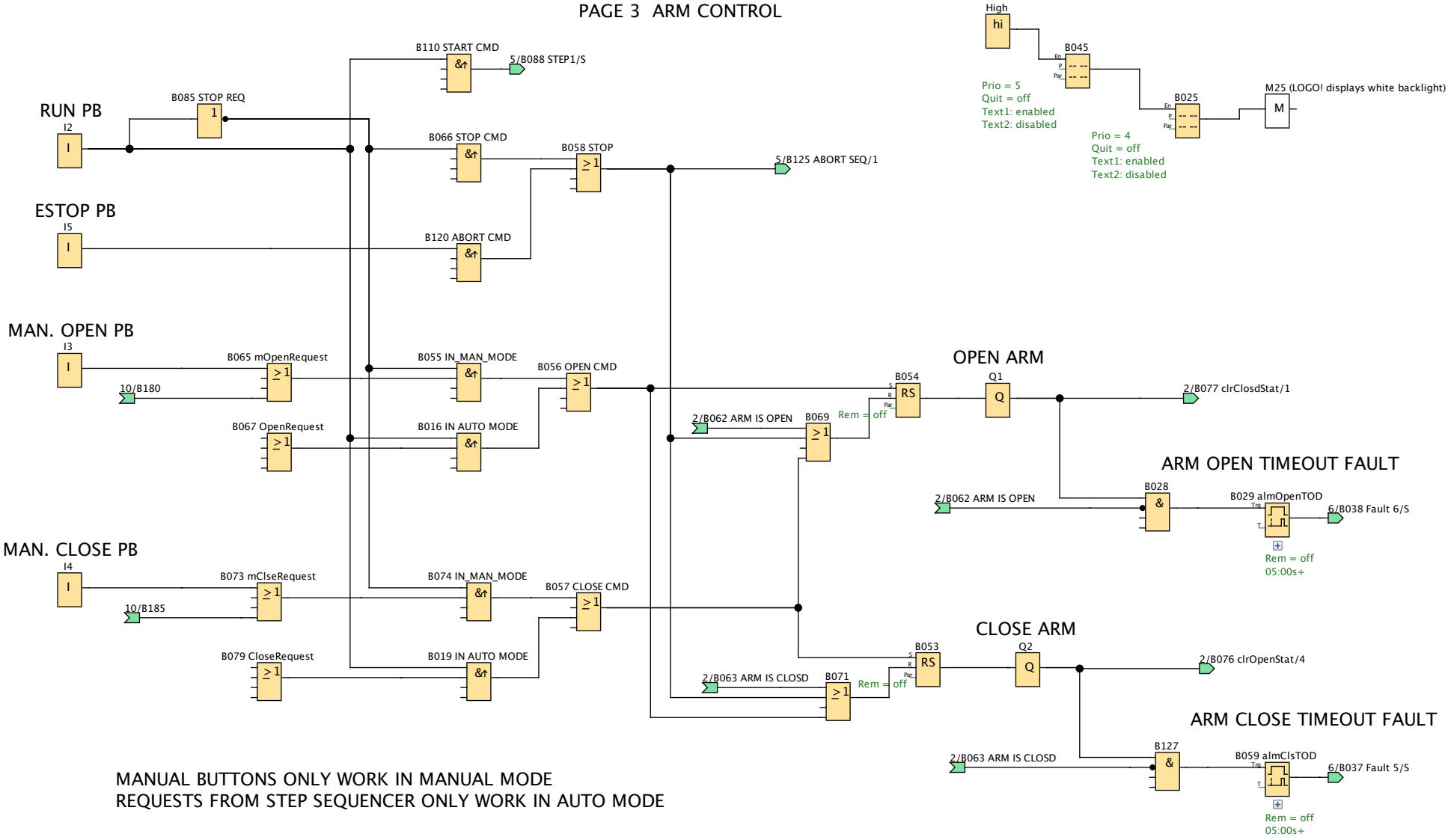
Date:	3/28/20 2:00 PM/4/2/20 6:44 PM		File:		Page:	2 / 31

PAGE 3 ARM CONTROL



MANUAL BUTTONS ONLY WORK IN MANUAL MODE
REQUESTS FROM STEP SEQUENCER ONLY WORK IN AUTO MODE

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Date:	3/28/20 2:00 PM/4/2/20 6:44 PM		File:		Page:	3 / 31

PAGE 4 TICK TOCK BIT

STEP 1 (HOMING). RETURN ARM TO HOME POSITION, RESET IO TO INITAL STATE
RESET MAX PRESSURE.

STEP 2. (INHALE) ADVANCE ARM TO CLAMPING POSITION, RECORD MAX PRESSURE

STEP 3. (PLATEAU) WAIT XXXX MSEC

STEP 4. RECORD PLATEAU PRESSURE

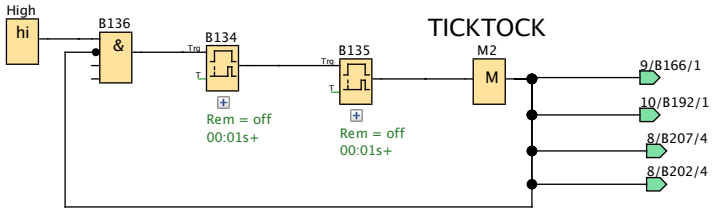
STEP 5. (EXHALE) RETURN ARM TO RETRACTED POSITION

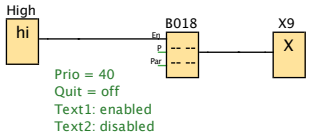
STEP 6. (MEASURE PEEP) RECORD PEEP PRESSURE

STEP 7. (PEEP) WAIT FOR PRESSURE TO DROP BELOW TRIGGER THRESHOLD
TO INITIATE NEXT BREATH, OR GO TO NEXT STEP AFTER XXX SEC.

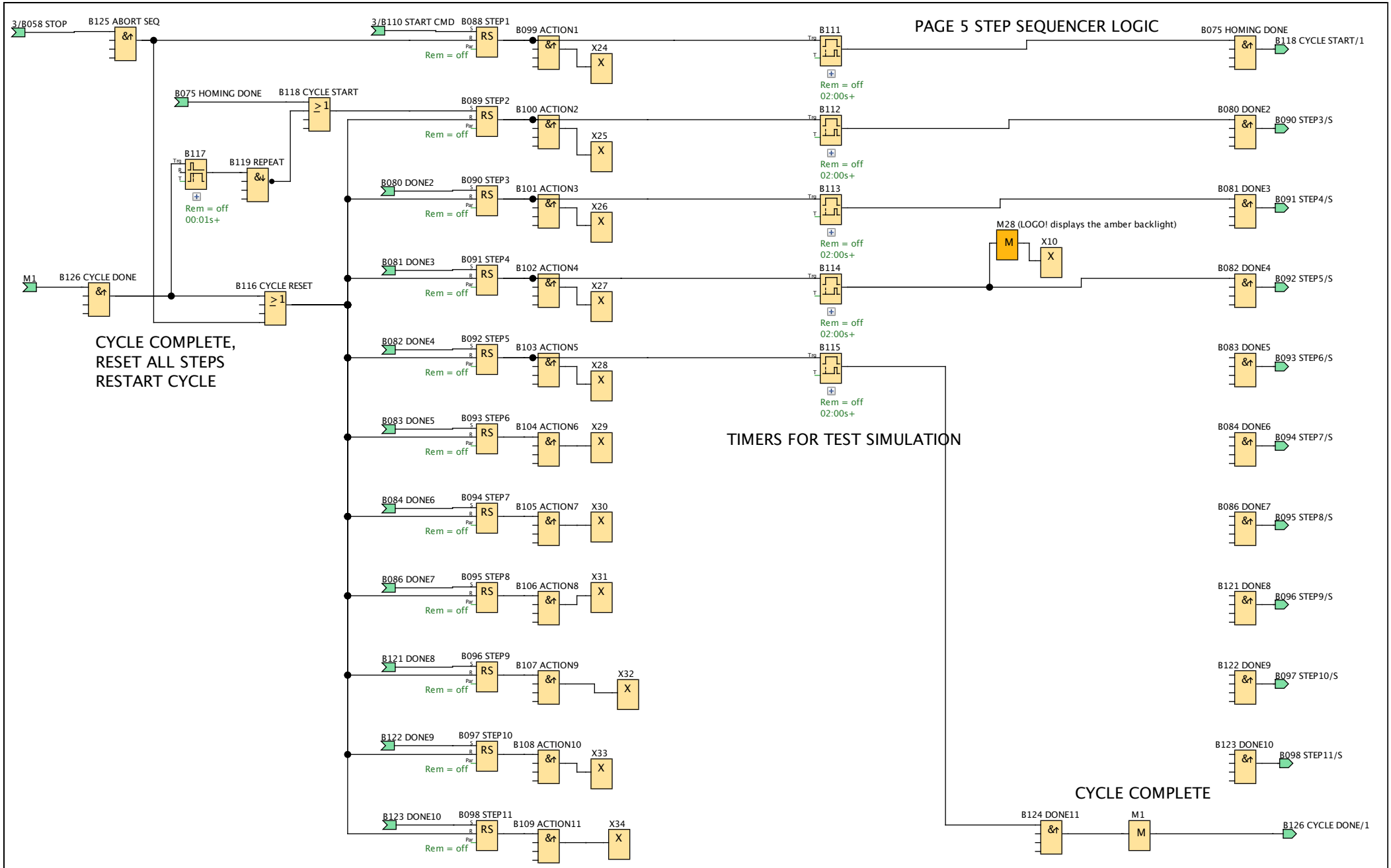
STEP 8. GO TO STEP 2

TICK TOCK BIT





Creator:	Eric Tischer		Project:	DIY Ventilator	Customer:	OpenSource
Checked:			Installation:		Diagram No.:	
Date:	3/28/20 2:00 PM/4/2/20 6:44 PM		File:		Page:	4 / 31



Creator:	Eric Tischer		Project:	DIY Ventilator	Customer:	OpenSource
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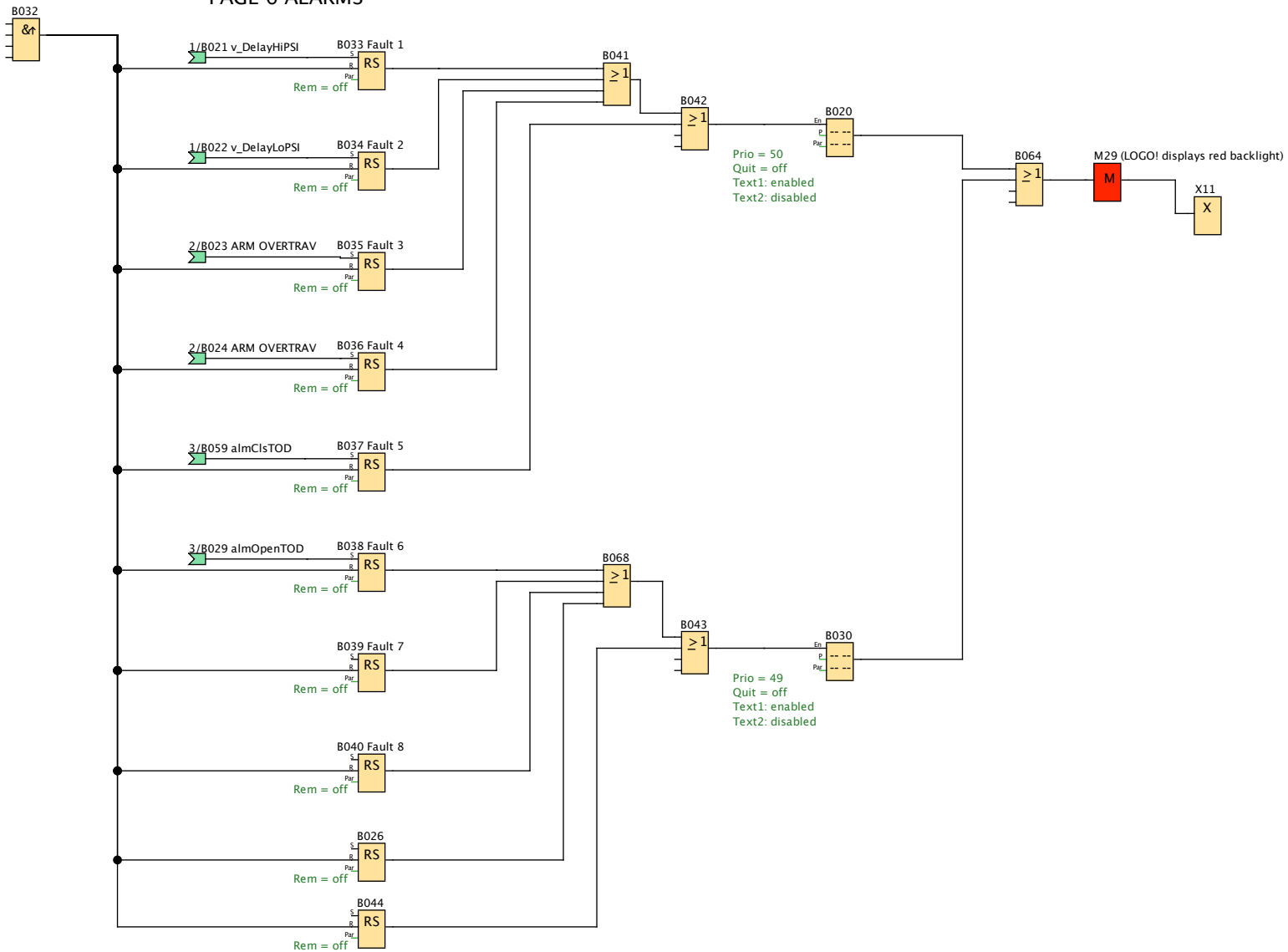
Date:	3/28/20 2:00 PM/4/2/20 6:44 PM		File:		Page:	5 / 31

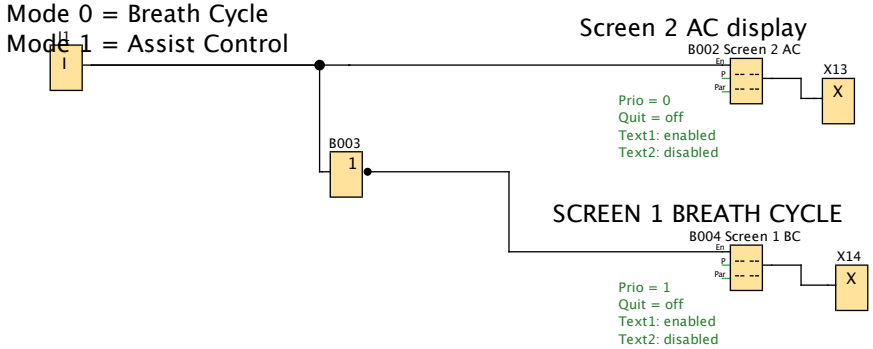
PAGE 6 ALARMS



Creator:	Eric Tischer		Project:	DIY Ventilator	Customer:	OpenSource
Checked:			Installation:		Diagram No.:	
Date:	3/28/20 2:00 PM/4/2/20 6:44 PM		File:		Page:	6 / 31

PAGE 7 MODE SELECT

Mode 0 = Breath Cycle
Mode 1 = Assist Control



Add counter for total breathing cycles since start
Add counter for pressure triggered breathing cycles since start
Add lifetime breathing cycles

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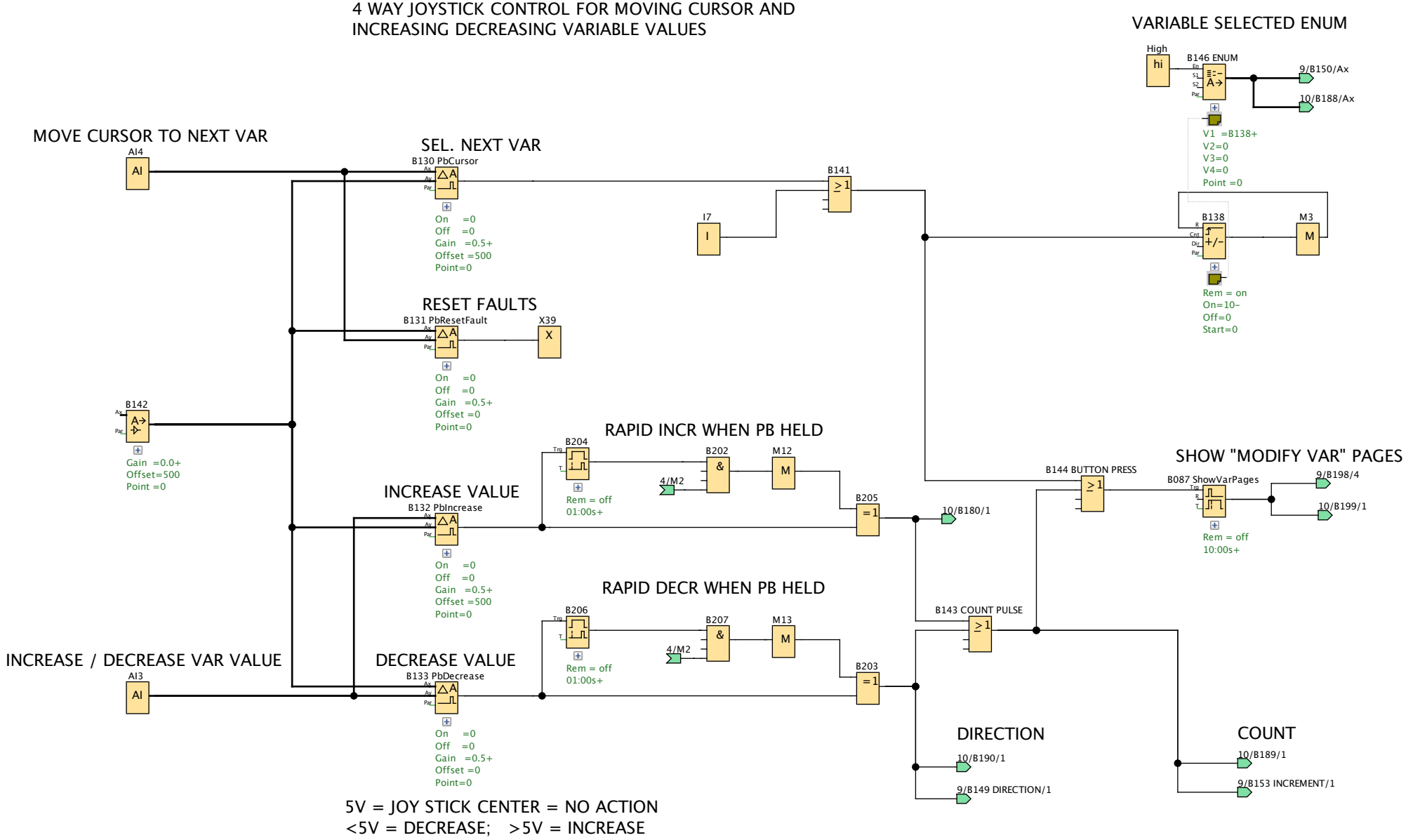
Checked:			Installation:		Diagram No.:	
Date:	3/28/20 2:00 PM/4/2/20 6:44 PM		File:		Page:	7 / 31

PAGE 8
4 WAY JOYSTICK CONTROL FOR MOVING CURSOR AND
INCREASING DECREASING VARIABLE VALUES

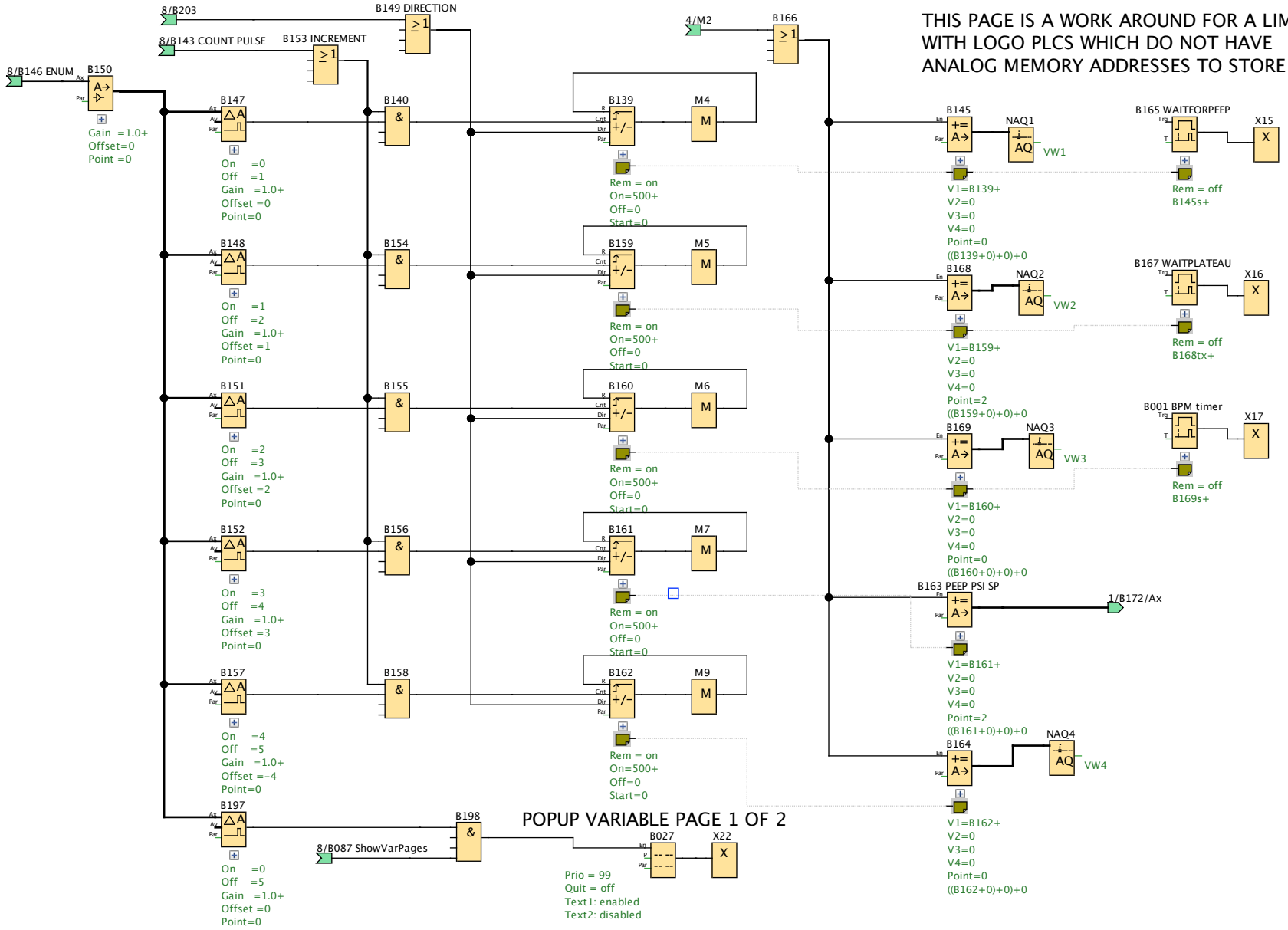


5V = JOY STICK CENTER = NO ACTION
<5V = DECREASE; >5V = INCREASE

Creator:	Eric Tischer		Project:	DIY Ventilator	Customer:	OpenSource
Checked:			Installation:		Diagram No.:	
Date:	3/28/20 2:00 PM/4/2/20 6:44 PM		File:		Page:	8 / 31

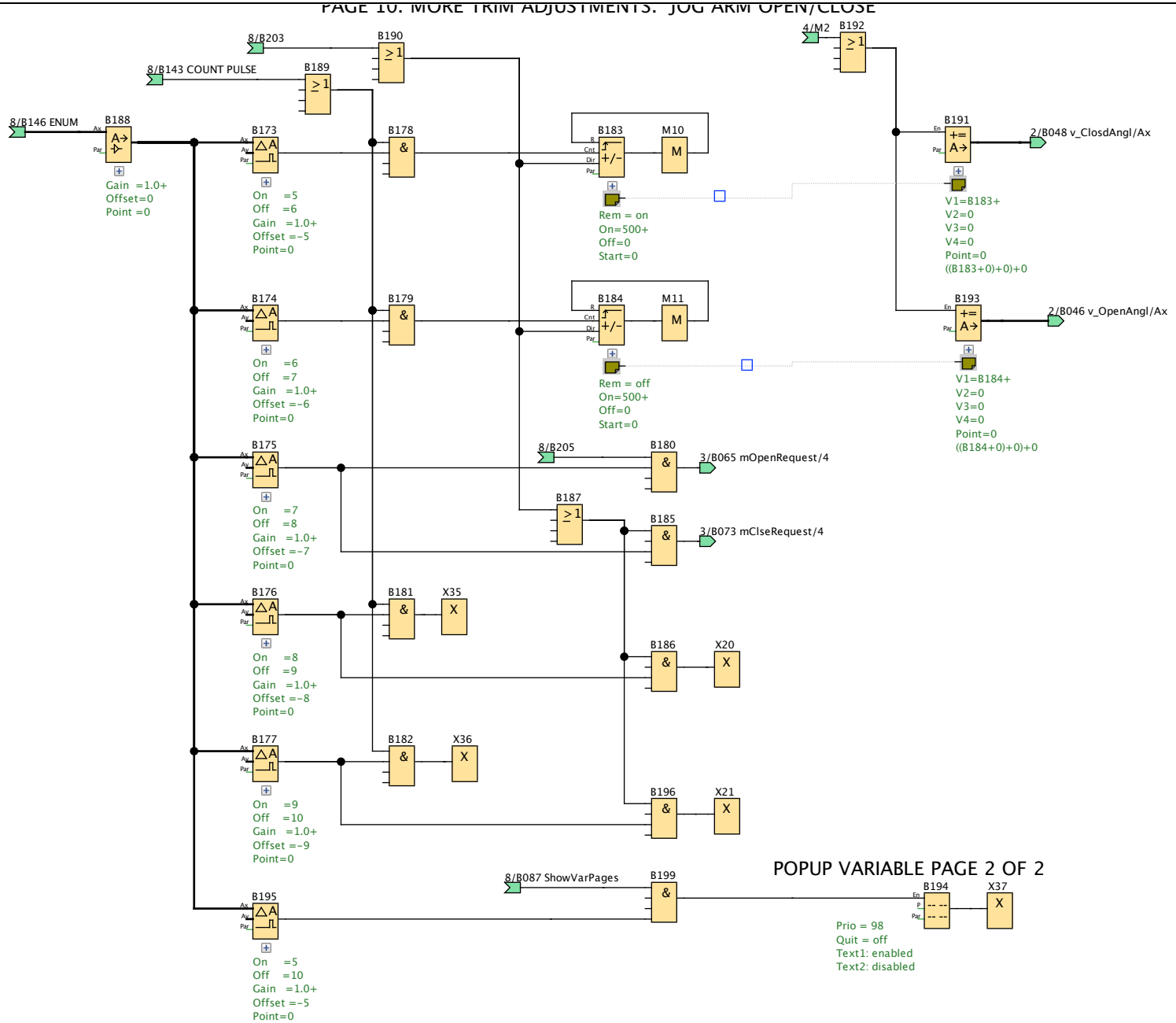
PAGE 9. TRIM ADJUSTMENTS TO VOLUME, PRESSURE, TIMERS... USING CURSOR LOGIC ON PREV. PAGE

THIS PAGE IS A WORK AROUND FOR A LIMIATION
WITH LOGO PLCS WHICH DO NOT HAVE
ANALOG MEMORY ADDRESSES TO STORE VALUES



PAGE 10. MORE TRIM ADJUSTMENTS... IOC ARM OPEN/CLOSE

Creator:	Eric Tischer		Project:	DIY Ventilator	Customer:	OpenSource
Checked:			Installation:		Diagram No.:	
Date:	3/28/20 2:00 PM/4/2/20 6:44 PM		File:		Page:	9 / 31



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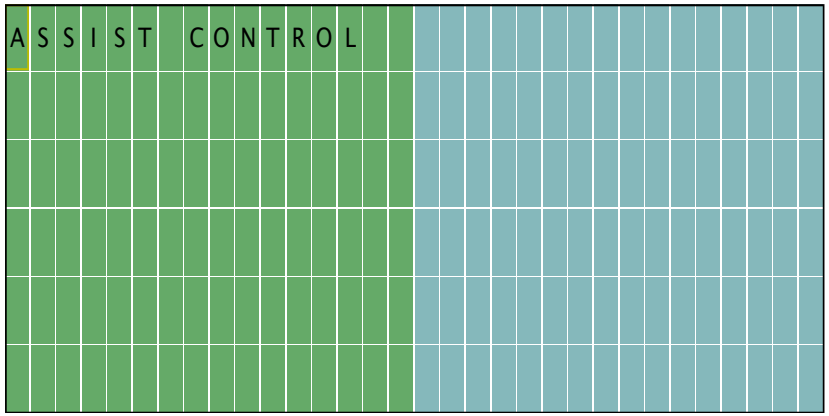
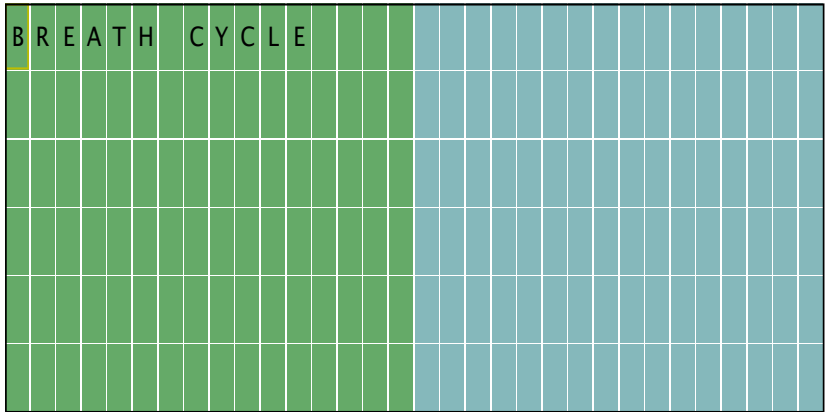
Checked:			Installation:		Diagram No.:	
Date:	3/28/20 2:00 PM/4/2/20 6:44 PM		File:		Page:	10 / 31

Block Number (Type)	Parameter
AI1(Analog input) : Pressure 0-10V 0-1.45psi	
AI2(Analog input) : ARM ANGLE 0-5V = 0-180 DEG	
AI3(Analog input) : INCREASE / DECREASE VAR VALUE	
AI4(Analog input) : MOVE CURSOR TO NEXT VAR	
B001 BPM timer(On-Delay) :	Rem = off B169s+
B002 Screen 2 AC(Message texts) : Screen 2 AC display  	Prio = 0 Quit = off Text1: enabled Text2: disabled --> Ticker setting - CBC - Line1: N - Line2: N - Line3: N - Line4: N - Line5: N - Line6: N Message Destination - Both

Creator:	Eric Tischer		Project:	DIY Ventilator	Customer:	OpenSource
Checked:			Installation:		Diagram No.:	
Date:	3/28/20 2:00 PM/4/2/20 6:44 PM		File:		Page:	11 / 31

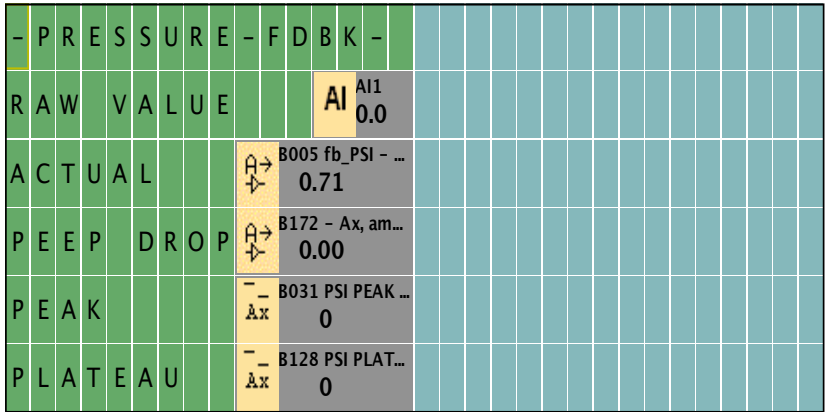
Block Number (Type)	Parameter
B004 Screen 1 BC(Message texts) : SCREEN 1 BREATH CYCLE 	Prio = 1 Quit = off Text1: enabled Text2: disabled --> Ticker setting - CBC - Line1: N - Line2: N - Line3: N - Line4: N - Line5: N - Line6: N Message Destination - Both
B005 fb_PSI(Analog Amplifier) :	Gain =0.19+ Offset=-37 Point =2
B006(Analog Comparator) :	On =0 Off =0 Gain =1.0+ Offset =0 Point=0
B007(Analog Amplifier) :	Gain =1.0+ Offset=0 Point =0
B008(Analog Comparator) :	On =0 Off =0 Gain =1.0+ Offset =0 Point=0

Block Number (Type)	Parameter
B009(Analog Comparator) :	On =0 Off =0 Gain =1.0+ Offset =0 Point=0
B010(Analog Comparator) :	On =0 Off =0 Gain =1.0+ Offset =0 Point=0
B011 v_HiLimPSI(Analog Amplifier) :	Gain =1.0+ Offset=140 Point =0
B012 v_HiLimAngle(Mathematic instruction) :	V1=499+ V2=0 V3=0 V4=0 Point=0 ((499+0)+0)+0
B013 v_LoLimPSI(Analog Amplifier) :	Gain =1.0+ Offset=2 Point =0
B014 v_LoLimAngle(Mathematic instruction) :	V1=2+ V2=0 V3=0 V4=0 Point=0 ((2+0)+0)+0
B015 PEEP START P(Max/Min) : RECORD PEEP STARTING PRESSURE	Rem = off Mode = 3 ResetMaxMin = false

Block Number (Type)	Parameter

B017(Message texts) :

Prio = 6
Quit = off
Text1: enabled
Text2: disabled

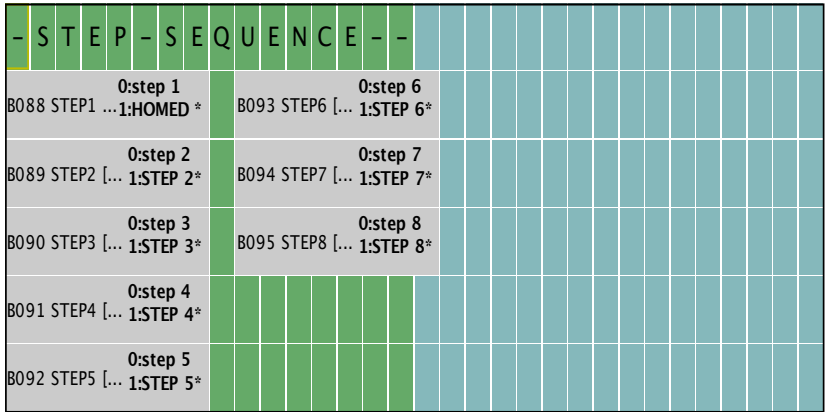


--> Ticker setting
- CBC
- Line1: N
- Line2: N
- Line3: N
- Line4: N
- Line5: N
- Line6: N

Message Destination
- Both

Line2.13 AI: AI1
Line3.10 B005 fb_PSI-Ax
Line4.10 B172-Ax
Line5.10 B031 PSI PEAK-Max
Line6.10 B128 PSI PLATEAU-Aq

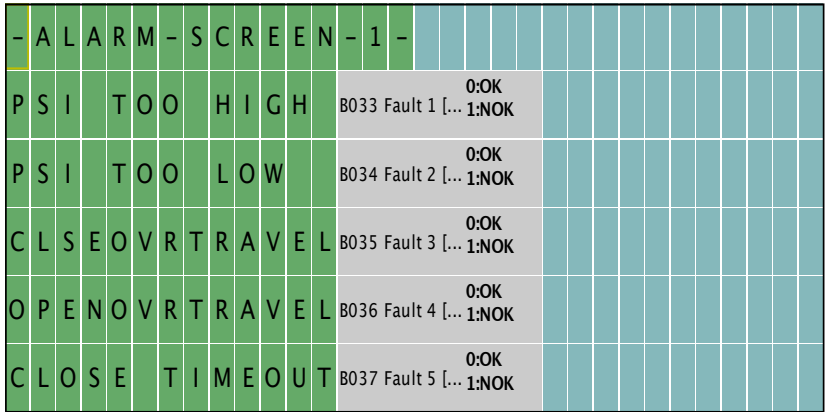
Block Number (Type)	Parameter
B018(Message texts) :	Prio = 40 Quit = off Text1: enabled Text2: disabled



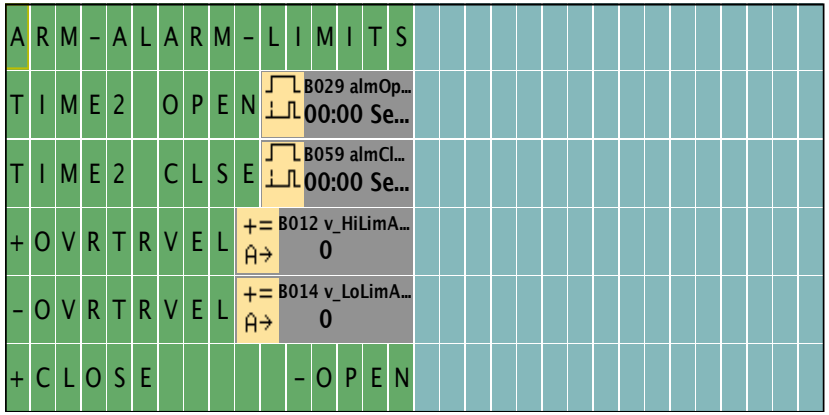
--> Ticker setting
- CBC
- Line1: N
- Line2: N
- Line3: N
- Line4: N
- Line5: N
- Line6: N

Message Destination
- Both

Line2.1 IOStatus: B088 STEP1;Off="step 1";On="HOMED *"
Line2.10 IOStatus: B093 STEP6;Off="step 6";On="STEP 6*"
Line3.1 IOStatus: B089 STEP2;Off="step 2";On="STEP 2*"
Line3.10 IOStatus: B094 STEP7;Off="step 7";On="STEP 7*"
Line4.1 IOStatus: B090 STEP3;Off="step 3";On="STEP 3*"
Line4.10 IOStatus: B095 STEP8;Off="step 8";On="STEP 8*"
Line5.1 IOStatus: B091 STEP4;Off="step 4";On="STEP 4*"
Line6.1 IOStatus: B092 STEP5;Off="step 5";On="STEP 5*"

Block Number (Type)	Parameter
B020(Message texts) :  Line2.14 IOStatus: B033 Fault 1;Off="OK";On="NOK" Line3.14 IOStatus: B034 Fault 2;Off="OK";On="NOK" Line4.14 IOStatus: B035 Fault 3;Off="OK";On="NOK" Line5.14 IOStatus: B036 Fault 4;Off="OK";On="NOK" Line6.14 IOStatus: B037 Fault 5;Off="OK";On="NOK"	Prio = 50 Quit = off Text1: enabled Text2: disabled --> Ticker setting - CBC - Line1: N - Line2: N - Line3: N - Line4: N - Line5: N - Line6: N Message Destination - Both
B021 v_DelayHiPSI(On-Delay) : PRESSURE TOO HIGH DELAY ALARM	Rem = off 00:10s+
B022 v_DelayLoPSI(On-Delay) : PRESSURE TOO LOW ALARM DELAY	Rem = off 02:00s+
B023 ARM OVERTRAV(On-Delay) : ARM ANGLE TOO HIGH ALARM DELAY	Rem = off 00:00s+
B024 ARM OVERTRAV(On-Delay) : ARM ANGLE TOO LOW ALARM DELAY	Rem = off 00:00s+

Block Number (Type)	Parameter
B025(Message texts) :	Prio = 4 Quit = off Text1: enabled Text2: disabled



--> Ticker setting
- CBC
  - Line1: N
  - Line2: N
  - Line3: N
  - Line4: N
  - Line5: N
  - Line6: N

Message Destination
- Both

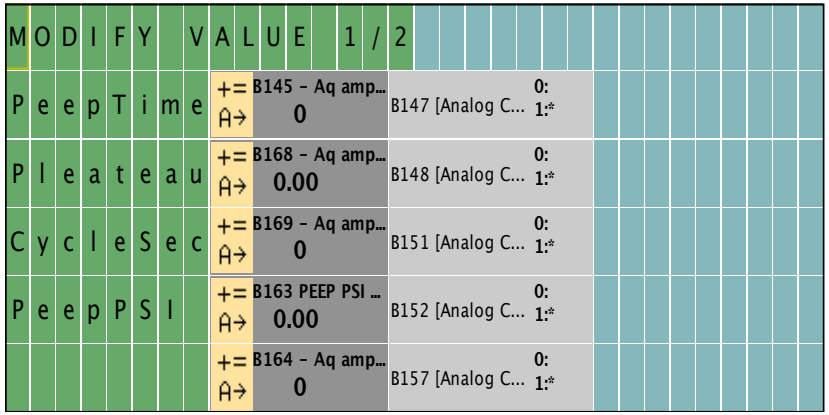
Line2.11 B029 almOpenTOD-TRest
Line3.11 B059 almClsTOD-TRest
Line4.10 B012 v_HiLimAngle-Aq
Line5.10 B014 v_LoLimAngle-P2

B026(Latching Relay) :	Rem = off

Block Number (Type)	Parameter

B027(Message texts) :
POPUP VARIABLE PAGE 1 OF 2

Prio = 99
Quit = off
Text1: enabled
Text2: disabled



--> Ticker setting
- CBC
- Line1: N
- Line2: N
- Line3: N
- Line4: N
- Line5: N
- Line6: N

Message Destination
- Both

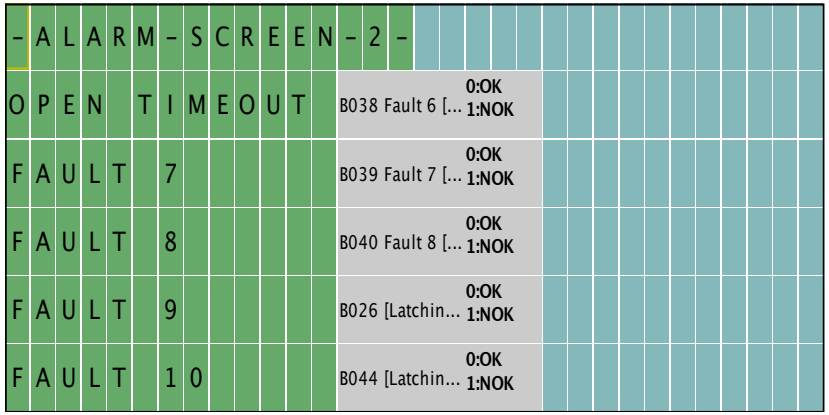
Line2.9 B145-Aq
Line2.16 IOStatus: B147;Off="";On="*"
Line3.9 B168-Aq
Line3.16 IOStatus: B148;Off="";On="*"
Line4.9 B169-Aq
Line4.16 IOStatus: B151;Off="";On="*"
Line5.9 B163 PEEP PSI SP-Aq
Line5.16 IOStatus: B152;Off="";On="*"
Line6.9 B164-Aq
Line6.16 IOStatus: B157;Off="";On="*"

B029 almOpenTOD(On-Delay) :

Rem = off
05:00s+

Creator:	Eric Tischer		Project:	DIY Ventilator	Customer:	OpenSource
Checked:			Installation:		Diagram No.:	
Date:	3/28/20 2:00 PM/4/2/20 6:44 PM		File:		Page:	18 / 31

Block Number (Type)	Parameter
B030(Message texts) :	Prio = 49 Quit = off Text1: enabled Text2: disabled



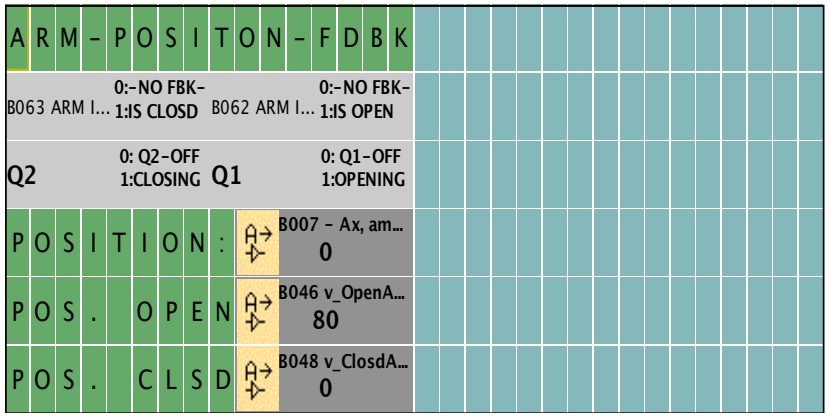
--> Ticker setting
- CBC
- Line1: N
- Line2: N
- Line3: N
- Line4: N
- Line5: N
- Line6: N

Message Destination
- Both

Line2.14 IOStatus: B038 Fault 6;Off="OK";On="NOK"
Line3.14 IOStatus: B039 Fault 7;Off="OK";On="NOK"
Line4.14 IOStatus: B040 Fault 8;Off="OK";On="NOK"
Line5.14 IOStatus: B026;Off="OK";On="NOK"
Line6.14 IOStatus: B044;Off="OK";On="NOK"

B031 PSI PEAK(Max/Min) : RECORD PEAK INHALE PRESSURE	Rem = off Mode = 1 ResetMaxMin = false
B032(AND (Edge)) : PAGE 6 ALARMS	
B033 Fault 1(Latching Relay) :	Rem = off
B034 Fault 2(Latching Relay) :	Rem = off
B035 Fault 3(Latching Relay) :	Rem = off
B036 Fault 4(Latching Relay) :	Rem = off

Block Number (Type)	Parameter
B037 Fault 5(Latching Relay) :	Rem = off
B038 Fault 6(Latching Relay) :	Rem = off
B039 Fault 7(Latching Relay) :	Rem = off
B040 Fault 8(Latching Relay) :	Rem = off
B044(Latching Relay) :	Rem = off
B045(Message texts) :	Prio = 5 Quit = off Text1: enabled Text2: disabled



--> Ticker setting
- CBC
- Line1: N
- Line2: N
- Line3: N
- Line4: N
- Line5: N
- Line6: N

Message Destination
- Both

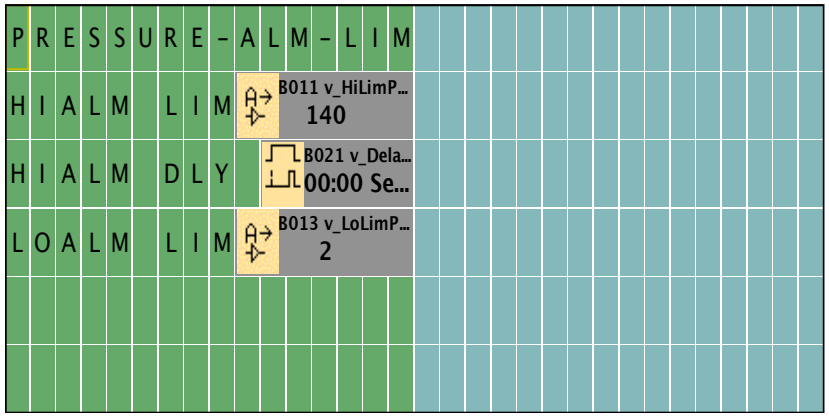
Line2.1 IOStatus: B063 ARM IS CLOSD;Off="-NO FBK-";On="IS CLOSD"
Line2.9 IOStatus: B062 ARM IS OPEN;Off="-NO FBK-";On="IS OPEN"
Line3.1 IOStatus: Q2;Off="Q2-OFF";On="CLOSING"
Line3.9 IOStatus: Q1;Off="Q1-OFF";On="OPENING"
Line4.10 B007-Ax
Line5.10 B046 v_OpenAngl-Ax
Line6.10 B048 v_ClosdAngl-Ax

B046 v_OpenAngl(Analog Amplifier) :	Gain =1.0+ Offset=80 Point =0

Block Number (Type)	Parameter
B047 v_MidAngle(Analog Amplifier) :	Gain =1.0+ Offset=0 Point =0
B048 v_ClosdAngl(Analog Amplifier) :	Gain =1.0+ Offset=0 Point =0
B049(Analog Comparator) :	On =0 Off =0 Gain =1.0+ Offset =0 Point=0
B050(Analog Comparator) :	On =0 Off =0 Gain =1.0+ Offset =0 Point=0
B051(Analog Comparator) :	On =0 Off =0 Gain =1.0+ Offset =0 Point=0
B053(Latching Relay) :	Rem = off
B054(Latching Relay) :	Rem = off
B059 almClsTOD(On-Delay) :	Rem = off 05:00s+
B062 ARM IS OPEN(Latching Relay) : ARM IS OPEN	Rem = off
B063 ARM IS CLOSD(Latching Relay) : ARM IS CLOSED	Rem = off

Block Number (Type)	Parameter
B087 ShowVarPages(Off-Delay) :	Rem = off 10:00s+
B088 STEP1(Latching Relay) :	Rem = off
B089 STEP2(Latching Relay) :	Rem = off
B090 STEP3(Latching Relay) :	Rem = off
B091 STEP4(Latching Relay) :	Rem = off
B092 STEP5(Latching Relay) :	Rem = off
B093 STEP6(Latching Relay) :	Rem = off
B094 STEP7(Latching Relay) :	Rem = off
B095 STEP8(Latching Relay) :	Rem = off
B096 STEP9(Latching Relay) :	Rem = off
B097 STEP10(Latching Relay) :	Rem = off
B098 STEP11(Latching Relay) :	Rem = off
B111(On-Delay) :	Rem = off 02:00s+
B112(On-Delay) :	Rem = off 02:00s+
B113(On-Delay) :	Rem = off 02:00s+
B114(On-Delay) :	Rem = off 02:00s+

Block Number (Type)	Parameter
B115(On-Delay) :	Rem = off 02:00s+
B117(Off-Delay) :	Rem = off 00:01s+
B128 PSI PLATEAU(Max/Min) : RECORD PLATEAU PRESSURE	Rem = off Mode = 0 ResetMaxMin = false
B129(Message texts) :	Prio = 7 Quit = off Text1: enabled Text2: disabled



--> Ticker setting
- CBC
- Line1: N
- Line2: N
- Line3: N
- Line4: N
- Line5: N
- Line6: N

Message Destination
- Both

Line2.10 B011 v_HiLimPSI-Ax
Line3.11 B021 v_DelayHiPSI-TRest
Line4.10 B013 v_LoLimPSI-Ax

B130 PbCursor(Analog Comparator) : SEL. NEXT VAR	On =0 Off =0 Gain =0.5+ Offset =500 Point=0

Block Number (Type)	Parameter
B131 PbResetFault(Analog Comparator) : RESET FAULTS	On =0 Off =0 Gain =0.5+ Offset =0 Point=0
B132 PbIncrease(Analog Comparator) : INCREASE VALUE	On =0 Off =0 Gain =0.5+ Offset =500 Point=0
B133 PbDecrease(Analog Comparator) : DECREASE VALUE	On =0 Off =0 Gain =0.5+ Offset =0 Point=0
B134(On-Delay) :	Rem = off 00:01s+
B135(On-Delay) :	Rem = off 00:01s+
B138(Up/Down counter) :	Rem = on On=10- Off=0 Start=0
B139(Up/Down counter) :	Rem = on On=500+ Off=0 Start=0
B142(Analog Amplifier) :	Gain =0.0+ Offset=500 Point =0

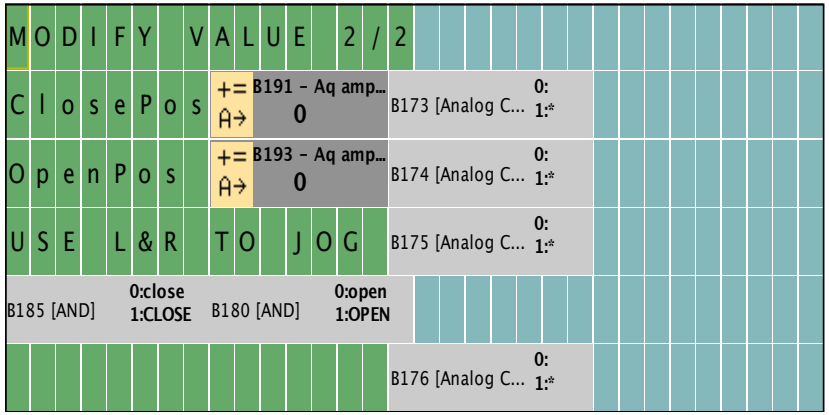
Block Number (Type)	Parameter
B145(Mathematic instruction) :	V1=B139+ V2=0 V3=0 V4=0 Point=0 ((B139+0)+0)+0
B146 ENUM(Analog MUX) : VARIABLE SELECTED ENUM	V1 =B138+ V2=0 V3=0 V4=0 Point =0
B147(Analog Comparator) :	On =0 Off =1 Gain =1.0+ Offset =0 Point=0
B148(Analog Comparator) :	On =1 Off =2 Gain =1.0+ Offset =1 Point=0
B150(Analog Amplifier) :	Gain =1.0+ Offset=0 Point =0
B151(Analog Comparator) :	On =2 Off =3 Gain =1.0+ Offset =2 Point=0
B152(Analog Comparator) :	On =3 Off =4 Gain =1.0+ Offset =3 Point=0

Block Number (Type)	Parameter
B157(Analog Comparator) :	On =4 Off =5 Gain =1.0+ Offset =-4 Point=0
B159(Up/Down counter) :	Rem = on On=500+ Off=0 Start=0
B160(Up/Down counter) :	Rem = on On=500+ Off=0 Start=0
B161(Up/Down counter) :	Rem = on On=500+ Off=0 Start=0
B162(Up/Down counter) :	Rem = on On=500+ Off=0 Start=0
B163 PEEP PSI SP(Mathematic instruction) :	V1=B161+ V2=0 V3=0 V4=0 Point=2 ((B161+0)+0)+0
B164(Mathematic instruction) :	V1=B162+ V2=0 V3=0 V4=0 Point=0 ((B162+0)+0)+0

Block Number (Type)	Parameter
B165 WAITFORPEEP(On-Delay) :	Rem = off B145s+
B167 WAITPLATEAU(On-Delay) :	Rem = off B168tx+
B168(Mathematic instruction) :	V1=B159+ V2=0 V3=0 V4=0 Point=2 ((B159+0)+0)+0
B169(Mathematic instruction) :	V1=B160+ V2=0 V3=0 V4=0 Point=0 ((B160+0)+0)+0
B171 INH DETECTED(Analog Comparator) : INHALE DETECTED	On =B172 Off =0 Gain =1.0+ Offset =0 Point=0
B172(Analog Amplifier) : PEEP PRESSURE DROP TRIGGER PSI	Gain =1.0+ Offset=0 Point =2
B173(Analog Comparator) :	On =5 Off =6 Gain =1.0+ Offset =-5 Point=0
B174(Analog Comparator) :	On =6 Off =7 Gain =1.0+ Offset =-6 Point=0

Block Number (Type)	Parameter
B175(Analog Comparator) :	On =7 Off =8 Gain =1.0+ Offset =-7 Point=0
B176(Analog Comparator) :	On =8 Off =9 Gain =1.0+ Offset =-8 Point=0
B177(Analog Comparator) :	On =9 Off =10 Gain =1.0+ Offset =-9 Point=0
B183(Up/Down counter) :	Rem = on On=500+ Off=0 Start=0
B184(Up/Down counter) :	Rem = off On=500+ Off=0 Start=0
B188(Analog Amplifier) :	Gain =1.0+ Offset=0 Point =0
B191(Mathematic instruction) :	V1=B183+ V2=0 V3=0 V4=0 Point=0 ((B183+0)+0)+0

Block Number (Type)	Parameter
B193(Mathematic instruction) :	V1=B184+ V2=0 V3=0 V4=0 Point=0 ((B184+0)+0)+0
B194(Message texts) : POPUP VARIABLE PAGE 2 OF 2	Prio = 98 Quit = off Text1: enabled Text2: disabled



--> Ticker setting
- CBC
- Line1: N
- Line2: N
- Line3: N
- Line4: N
- Line5: N
- Line6: N

Message Destination
- Both

Line2.9 B191-Aq
Line2.16 IOStatus: B173;Off="";On="*"
Line3.9 B193-Aq
Line3.16 IOStatus: B174;Off="";On="*"
Line4.16 IOStatus: B175;Off="";On="*"
Line5.1 IOStatus: B185;Off="close";On="CLOSE"
Line5.9 IOStatus: B180;Off="open";On="OPEN"
Line6.16 IOStatus: B176;Off="";On="*"

B195(Analog Comparator) :	On =5 Off =10 Gain =1.0+ Offset =-5 Point=0

Block Number (Type)	Parameter
B197(Analog Comparator) :	On =0 Off =5 Gain =1.0+ Offset =0 Point=0
B200(Analog Comparator) :	On =0 Off =0 Gain =1.0+ Offset =0 Point=0
B201(Analog Comparator) :	On =0 Off =0 Gain =1.0+ Offset =0 Point=0
B204(On-Delay) :	Rem = off 01:00s+
B206(On-Delay) :	Rem = off 01:00s+
I1(Input) : Mode 0 = Breath Cycle Mode 1 = Assist Control	
I2(Input) : RUN PB	
I3(Input) : MAN. OPEN PB	
I4(Input) : MAN. CLOSE PB	
I5(Input) : ESTOP PB	

Block Number (Type)	Parameter
M1(Flag) : CYCLE COMPLETE	
M2(Flag) : TICKTOCK	
Q1(Output) : OPEN ARM	
Q2(Output) : CLOSE ARM	